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- Elemente der absoluten Geometrie. Von J. Frischauf. 8vo. 142 pp. Teubner. Leipzig. 1876. 3M. 40 pf.
- Vorlesungen über mathematischen Physik. Mechanik. Von G. Kirchhoff. 8vo. Leipzig. 1876.
- Bernhard Riemann's gesammelte mathematische Werke, und wissenschaftlicher Nachlass. Herausgegeben unter Mitwirkung von R. Dedekind von H. Weber. 8vo. 526 pp. Teubner. Leipzig. 1876.
- Partielle Differentialgleichungen und ihre Anwendung auf physikalischen Fragen. Von Bernhard Riemann. Bearbeitet von Hattendorff. 2 Auflage. 8vo. Braunschweig. 1876.
- Abhandlungen von F. W. Bessel. Herausgegeben von R. Engelmann. Bandes II und III. 4to. Engelmann. Leipzig. 1876. 18 M. und 22 M.
- Principien einer electrodynamischen Theorie der Materie von J. C. F. Zöllner. Band I. Buch I. Abhandlungen zur atomischen Theorie der Electrodynamik von Wilhelm Weber. 4to. Engelmann. Leipzig. 1876. 18 M.
- Theorie des Heliometers von H. Seeliger. Leipzig. 1877.
- Vermischte Untersuchungen zur Geschichte der mathematischen Wissenschaften. Von Dr. S. Günther. 8vo. Teubner. Leipzig. 1876.

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### NOTE ON A LOGARITHMIC SERIES.

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BY W. E. HEAL, WHEELING, INDIANA.

THE common logarithmic series, given in all standard works on Algebra, may, by a simple substitution, be transformed into another that converges more rapidly. I do not remember of seeing the series given in any work that has come under my notice, though it may be well known by mathematicians. I think it would be well to have this series introduced into our Algebras and taught in our schools.

Take the series

$$\log(z+1) = \log z + 2M \left[ \frac{1}{2z+1} + \frac{1}{3(2z+1)^3} + \frac{1}{5(2z+1)^5} \dots \right].$$

Let  $z = x^2 - 1$  and we have

$$\log x^2 = \log(x^2 - 1) + 2M \left[ \frac{1}{2x^2 - 1} + \frac{1}{3(2x^2 - 1)^3} + \frac{1}{5(2x^2 - 1)^5} \dots \right].$$

But  $\log(x^2 - 1) = \log(x+1) + \log(x-1)$  and  $\log x^2 = 2 \log x$ . Therefore

$$\log(x+1) = 2 \log x - \log(x-1) - 2M \left[ \frac{1}{2x^2 - 1} + \frac{1}{3(2x^2 - 1)^3} + \frac{1}{5(2x^2 - 1)^5} \dots \right].$$